

DERMATOPHYTE ISOLATIONS IN NORTHERN IRELAND 1967-1973

by

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THIS is the second retrospective survey of the work of the Mycological Diagnostic Service since its establishment in 1959. Its purpose is to review the isolation of dermatophytes (ringworm fungi) of both human (anthropophilic) and animal (zoophilic) origin in Northern Ireland over the period 1967 to 1973, and to compare the findings with previous reports for the province (Mackenzie and Rusk, 1964), and with the situation in the United Kingdom as a whole.

SPECIMENS AND ISOLATIONS

During the period 1967-1973, investigations were made on 13,864 specimens from 9,999 patients. Dermatophytes were isolated on 1699 (12.3 per cent) occasions and there was microscopic evidence of fungal infection in a further 246 (1.8 per cent) cases, although no fungus was isolated on subsequent culture. Of these microscopically positive specimens, 122 (49.6 per cent) were identified as *Malassezia furfur*, the cause of *Pityriasis versicolor*. The frequency of isolation of different dermatophyte species from human sources is shown in Table 1. The table does not include 3 isolations of *Trichophyton equinum* made from clippings of infected horse hairs.

TABLE 1
Dermatophyte Species Cultured from Human Sources 1967-1973

Species	Number of isolates							Total no. of isolates
	1967	1968	1969	1970	1971	1972	1973	
<i>Trichophyton verrucosum</i>	105	96	55	71	73	59	32	491
<i>T. rubrum</i>	36	54	35	64	44	33	32	298
<i>Epidermophyton floccosum</i>	36	36	26	34	29	31	19	211
<i>T. mentagrophytes var interdigitale</i>	11	5	39	21	31	45	50	202
<i>T. mentagrophytes</i>	25	23	37	33	34	27	24	202
<i>Microsporum canis</i>	36	38	27	16	21	23	24	185
<i>T. sulfureum</i>	11	12	23	14	15	7	23	105
<i>T. violaceum</i>	—	—	—	—	—	1	—	1
Unidentified	—	1	—	1	—	—	2	4
% Animal ringworm	63.8	60.6	49.2	47.4	51.8	48.2	39.2	51.8

SITES OF INFECTION

Scalp Ringworm

Table 2 shows the species of dermatophytes isolated from ringworm of the scalp from 1967 onwards. The findings confirm the report of Mackenzie and Rusk (1964) that the majority of such infections are zoophilic in origin, but also show a further decrease in the isolation of *T. sulfureum*. This organism was responsible for 42 per cent of cases of scalp ringworm diagnosed in 1959 (Mackenzie and McArdle, 1960), but was isolated in only 14.5 per cent of cases during the period of this report. Although several 'hairbrush' surveys were carried out between 1967 and 1973, no outbreaks of *T. sulfureum* were detected in the children tested.

TABLE 2
Ringworm of the Scalp

Causative organism	1967	1968	Number of isolations in					Total no. of isolations
			1969	1970	1971	1972	1973	
<i>M. canis</i>	23	10	9	6	13	14	15	90
<i>T. verrucosum</i>	5	10	9	12	5	10	5	56
<i>T. sulfureum</i>	4	10	2	4	1	—	5	26
<i>T. mentagrophytes</i>	2	—	—	1	—	1	3	7
% Animal ringworm	88.2	66.6	90.0	82.6	94.5	96.0	82.1	85.5

Ringworm of the Feet

The dermatophyte species isolated from cases of ringworm of the feet are shown in Table 3. *T. rubrum* is now the organism most frequently isolated from foot lesions, and toe-nail involvement was found in 63 instances. *T. mentagrophytes* and *T. mentagrophytes* var. *interdigitale* were isolated on rare occasions from nail clippings, but we have recorded no case of nail infection due to *E. floccosum*. The only significant incidence of zoophilic infection was due to *T. mentagrophytes*, which accounted for 21 per cent of isolations from this site.

TABLE 3
Ringworm of the Feet

Causative organism	1967	1968	Number of isolations in					Total no. of isolations
			1969	1970	1971	1972	1973	
<i>T. rubrum</i>	28	30	19	39	23	15	14	168
<i>T. mentagrophytes</i> var <i>interdigitale</i>	11	19	3	13	21	23	34	124
<i>E. floccosum</i>	7	8	6	14	7	5	9	56
<i>T. mentagrophytes</i>	9	10	14	17	19	12	10	91
% Animal ringworm	16.6	20.8	33.3	20.5	27.1	21.8	14.9	20.7

Ringworm of the Trunk, Limbs and Face

Zoophilic dermatophytes were the most common isolates from lesions of the trunk, limbs and face (Table 4), accounting for 73 per cent of the total, and *T. verrucosum*, in particular, accounting for 49 per cent. Although the distribution of isolations was fairly stable until 1971, a pronounced downward trend in the number of zoophilic isolates occurred thereafter, particularly noticeable in 1973. In that year, however, the total number of dermatophyte isolates was the lowest recorded by the Mycological Diagnostic Service since its establishment in 1959, and the figures may not represent the true incidence of zoophilic infection in the community.

TABLE 4
Ringworm of the Trunk, Limbs and Face

Causative organism	Number of isolations in							Total no. of isolations
	1967	1968	1969	1970	1971	1972	1973	
<i>T. verrucosum</i>	88	65	37	44	54	47	25	360
<i>M. canis</i>	28	24	19	9	7	9	6	102
<i>T. mentagrophytes</i>	10	11	18	15	10	9	6	79
<i>T. rubrum</i>	12	12	12	7	5	8	8	64
<i>T. sulfureum</i>	7	6	7	6	8	7	12	53
<i>E. floccosum</i>	12	5	6	6	4	5	5	43
<i>T. mentagrophytes</i> var <i>interdigitale</i>	1	2	6	2	4	15	8	38
% Animal ringworm	79.7	80.0	70.5	76.4	77.2	65.0	52.9	73.2

The isolation of *T. violaceum* from scrapings from an arm lesion on a six-year-old child was somewhat unexpected. This organism is not endemic in the United Kingdom, and is most commonly found in Africa and Eurasia (Rebell, Taplin & Blank, 1964). However, further investigation showed that the child had recently holidayed in India, and the lesion had developed shortly after her return.

Ringworm of the Groin

E. floccosum was the infecting agent in 90 out of 159 cultures from patients with *tinea cruris*, and *T. rubrum* was isolated in 48 cases. *T. mentagrophytes* var. *interdigitale* was isolated on 21 occasions, and no zoophilic infections of this region were recorded.

COMMENTS

This survey confirms previous reports that Northern Ireland has a high incidence of infection due to zoophilic dermatophytes, and, in particular, that *T. verrucosum*, the cause of cattle ringworm, is the dermatophyte most frequently isolated from patients (Mackenzie & McArdle, 1960; Mackenzie, Corkin & Bell, 1961; Mackenzie, Corkin & Rusk, 1962, 1963). Between 1967 and 1973, *T. verrucosum* accounted for 29 per cent of all dermatophyte isolations in Northern Ireland, a figure not far removed from the 34 per cent incidence reported by Mackenzie and Rusk (1964) for the period 1959-1963. Northern Ireland differs markedly from the rest of the

United Kingdom in this respect. The incidence of *T. verrucosum* isolates in the United Kingdom and Republic of Eire during the three year period 1967-1969 was 7.8 per cent and the total incidence of zoophilic infections for the same period was less than 25 per cent (British Medical Journal, 1970). In a recent survey of dermatophyte infections over a ten-year period in South-East England, English and Lewis (1974) report a 16 per cent incidence of *T. verrucosum* infection, and an overall zoophilic isolation rate of 52 per cent.

Although zoophilic dermatophytes are the predominant isolates in Northern Ireland, there has been a marked increase in the incidence of anthropophilic infections as judged in the laboratory. This applies in particular to the isolation of *T. rubrum* and *T. mentagrophytes* var. *interdigitale* which now account for 18 per cent and 12 per cent of isolations respectively. Between 1959 and 1963, Mackenzie and Rusk (1964) reported incidences of 9 per cent and 5 per cent respectively. In the United Kingdom as a whole, *T. rubrum* accounts for 55 per cent of dermatophyte isolations, and *T. mentagrophytes* var. *interdigitale* for 12 per cent (Gentles, 1974), and English and Lewis (1974) reported a 42 per cent incidence of *T. rubrum* infection in South-East England.

Although the findings of the Mycological Diagnostic Service may not reflect the true incidence and distribution of different dermatophytes in Northern Ireland, they should provide an accurate representation of dermatophyte infections in patients referred to dermatological clinics in the province. Although zoophilic dermatophytes are the most common isolates, over the past seven years there has been a definite trend towards a higher incidence of infection passed by human to human transfer. In fact, if the high incidence of *T. verrucosum* isolations is ignored, the relative incidence of other dermatophyte isolations differs little from that reported by English and Lewis (1974) and Gentles (1974). Presumably, the high incidence of cattle ringworm reflects the strong agricultural bias of the Northern Ireland economy, and it would be of considerable interest to compare these findings with observations in areas with a similar economy in other parts of the United Kingdom.

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